

## OUR BOOK SHELF.

*The Art of the Goldsmith and Jeweller: a Treatise on the Manipulation of Gold in the Various Processes of Goldsmith's Work, and the Manufacture of Personal Ornaments, &c., &c., for the Use of Students and Practical Men.* By T. B. Wigley, assisted by J. H. Stansbie. Second edition, revised and enlarged. Pp. xii+264. (London: C. Griffin and Co., Ltd., 1911.) Price 7s. 6d. net.

THE work of the goldsmith and the jeweller, like that of many other craftsmen, has undergone a striking change of late years. Formerly the goldsmith was an artist making his own designs, and working them out with infinite patience and cunning, but seldom finding himself bound down to routine. He served an apprenticeship and was taught the various branches of the craft. Now that vast quantities of cheap jewellery of all sorts are manufactured, largely by the use of machinery, the workmen, even if something more than mere machine-minders, are engaged on some one special branch and learn no other. Such a system, of course, threatens the artistic side with extinction, and the establishment of technical schools and the production of such books as this one under review, revealing the mysteries of the ancient craft, become a necessity.

Mr. Wigley, with his long experience as headmaster of the Jewellers' and Silversmiths' Association Technical School, has the advantage of knowing what teachers and students require, and has written a very useful book. It is not detailed enough for students without demonstrations, but for the same reason it would not be painfully tedious to practical men, and would be by no means out of place in the workshop.

Details, however, are not lacking. Students are warned against certain pitfalls with almost meticulous care. As an instance, there may be cited the remark on p. 36, in dealing with the preparation of gold alloys:—"In adding decimal quantities together it is important to keep the decimal points under each other." On the other hand, some workshop knowledge is assumed, as on p. 70, where we are told that a lathe may be used for "turning pillars and small fittings, milling bezels, knurling edges of stud backs, sawing off joints, &c.," none of these terms being explained.

The book does not give an accurate picture of the industry as it exists to-day, as it leaves out of account most of the labour-saving machines and large-scale manufacturing methods. Moreover, the artistic side is not so persuasively presented as in Wilson's "Silver Works and Jewellery," and little space is devoted to history, but the book seems exactly adapted for those preparing for the technological examinations of the City and Guilds of London Institute, and thus it thoroughly justifies its existence.

*The Adventures of James Capen Adams, Mountaineer and Grizzly Bear Hunter of California.* By Theodore H. Hittell. Pp. xiii+373. (London: T. Werner Laurie, n.d.) Price 6s. net.

As we learn from the introduction, this book has a somewhat remarkable history. It first saw the light at Boston, U.S.A., so long ago as 1860, but, on account of the breaking out of the civil war, only a comparatively small number of copies appear to have been issued, and its publication was soon discontinued altogether. The present issue is an exact replica of the original, and is thus out of date in the matter of typography and illustrations; indeed, in the case of the latter this is self-apparent, as they are in a distinctly "prehistoric" style. The remarkable history of the book is, however, by no means exhausted by the above,

for Mr. T. H. Hittell, who took down the narrative from the lips of J. C. Adams in the autumn of 1856, is still alive, and has acted as editor of the present issue. In saying that the book is a replica of the original, it might have been mentioned that the introduction and a postscript are new. The latter gives an account of the last days of Adams, who joined Barnum's exhibition, and appears to have died soon after 1860, if not, indeed, at the close of that year.

Such interest as the book possesses for the naturalist is to be found in the circumstance that it relates to a period when the big-game fauna of North America still retained a considerable share of its original abundance; and it is specially noteworthy to find Adams describing how he once "rounded up" a herd of prongbuck (antelope), and actually killed some half-dozen with his knife. But Adams, although he had a try at game of every kind, appears to have devoted special attention to grisly bears, which he not only killed, but captured and tamed to such degree that they were used for carrying baggage on the march. The book is thus well worthy of the attention, not only of those devoted to sport, but also of those interested in animal-taming.

R. L.

*A New Law of Thought and its Logical Bearings.*

By E. E. Constance Jones. With a preface by Prof. Stout. Pp. viii+75. (Cambridge: University Press, 1911.) Price 2s. net.

MISS JONES's object in this brief essay is to propound "a certain analysis of categorical propositions of the forms *S is P*, *S is not P*, to show that this is the only general analysis which it is possible to accept, and to indicate its bearing upon logical science." We need propositions of these forms for significant assertion, and without them no satisfactory statement can be given of the three fundamental laws of thought. The first two of these are commonly formulated as (1) *A is A*, (2) *A is not non-A*, and the third sometimes as *A is either A or non-A*. Desperate efforts have been made by logicians to give a valuable meaning to *A is A*; but if *A is A*, interpreted as *A is A*, is retained as the first fundamental law, there is no possible passage from it to *A is B*. Lotze therefore gives up (theoretically) *S is P*. *A is A* tells us no more than *A is A*, and if we begin with it, we must also end with it, if we are to be consistent. We must, then, not begin with it, but with a law of significant assertion—assertion of the forms *S is P*, *S is not P*. If we start with the principle that *every subject of predication is an identity (of denotation) in diversity (of intension)* this law and the laws of contradiction and excluded middle do furnish a real and adequate and obvious basis and starting point of "formal" logic.

Miss Jones illustrates and applies her contention in a concise but interesting way, and Prof. Stout thinks that she makes out her case.

*Electricity in Locomotion: an Account of its Mechanism, its Achievements, and its Prospects.* By Adam G. Whyte. Pp. vii+143. (Cambridge: University Press, 1911.) Price 1s. net.

THE author gives in a very concise form a brief history of the first tramways and railways, and proceeds to show how the development of electric tramways has taken place in spite of great opposition from the æsthetic point of view, and also from causes arising out of the Tramways Act of 1870. The various systems of electric traction are carefully considered and the advantages of each fully discussed. Further chapters deal with the trolley omnibus, accumulator, electric traction, and regenerative control. The causes of failure of the accumulator-driven vehicle are ade-

quately considered, and also the advantages of the trolley omnibus when acting as a feeder for electric tramways.

The latter part of the book is devoted to petrol-electric vehicles and electric railways, while a chapter is included which deals with electric traction curiosities. A full description is given of the system and working of the Metropolitan District Railway, the London, Brighton, and South Coast electrified line, and the "Underground" Tube combination and the other tubes.

With regard to the petrol-electric systems, some interesting facts are given dealing with its aspect with regard to marine propulsion as advocated by Messrs. Durtnell, Mavor, and others. The advantages of the system, if successfully applied to warships and liners, would be enormous, but at present it has not got very much beyond the experimental stages, though there is hope that it may prove its worth in the near future.

Finally, the monorail systems are described, together with some other general arrangements of self-contained generating stations on wheels, &c., making, with the previous chapters, an interesting summary of the history of electric traction from its commencement to the present day.

*British Ferns: a Pocket "Help" for the Collector.* By F. G. Heath. Pp. x+130. (London: Sir Isaac Pitman and Sons, Ltd., 1911.) Price 2s. net.

THE author's knowledge of fern species and their habitats has been manifested in previous publications, so that one is prepared to find this real pocket-book, measuring  $6\frac{1}{2}$  by  $3\frac{3}{4}$  inches, a trustworthy and desirable acquisition when making an excursion in quest of ferns. Forty-five species are enumerated, but varieties with one exception are omitted. The descriptions are written primarily for the amateur collector, and serviceable assistance is provided in the illustrations. The information is tabulated under the headings frond length, description, usual habitat, and localities. The list of localities, given as fully as possible, represents an arduous piece of work. Certain introductory sections are prefixed, of which the two giving definitions and general habitats are most desirable and helpful, but the others are imaginative rather than scientific; it is not necessary to go beyond the statement that every point of the germ (sporeling) is equally ready to produce roots or a stem. Disregarding the first four sections, the book provides a compact, informative guide.

*Aërial Locomotion.* By E. H. Harper and A. Ferguson. With an introduction by Prof. G. H. Bryan, F.R.S. Pp. xii+164. (Cambridge: University Press, 1911.) Price 1s. net.

POPULAR handbooks on aërial navigation are now issuing from the press in a constant stream, and as their number grows the reviewer naturally judges of each new arrival by comparing it with its forerunners.

The exact public for which the little book under notice is intended is difficult to determine. The book is accurate, but it is dull; it is unattractive, and is poorly arranged. We cannot imagine the book being read for amusement, as the style is difficult to follow, or for information, owing to the absence of shoulder-notes, index, sectional arrangement, and other of the common aids to study.

Clarity of expression is lacking in very many places, while the sentence on p. 60, "If the elevator is carried normally in a different position during flight, all the conditions of flight are changed," is quite incomprehensible.

As has been said, the book is accurate, but it is scarcely calculated to attain its apparent object of interesting the public in the science of aéronautics.

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*Nature's Pageant: The Story of the Seasons.* By Margaret Cameron. Pp. iv+120. (London: Blackie and Son, Ltd., 1911.) Price 1s.

THIS little book is an attempt to teach nature-study to children of seven years of age. They are supposed to read the simply-worded story, in which plants and animals talk, and to look at the pictures. In our judgment, nature-study lessons are of little value unless they are concerned with the observation of the objects themselves; and such attempts as are here given to combine information with imagination are not the best means of cultivating interest in literature or science.

*Assaying and Metallurgical Analysis. For the Use of Students, Chemists, and Assayers.* By E. L. Head and Prof. A. H. Sexton. Second edition. Pp. x+451. (London: Longmans, Green and Co., 1911.) Price 12s. 6d. net.

THE differences between this edition and the preceding one are not important. A few new methods are included, such as the determinations of copper and of iron by titanous chloride and the volumetric estimation of nickel by cyanide, but the text generally remains unchanged, and the merits and occasional defects of the book have not been modified. It is still one of the most useful works on the subject available.

#### LETTERS TO THE EDITOR.

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#### On the $\alpha$ -Ray Theory of Aurora Borealis.

In a letter to NATURE of April 13 (vol. lxxxvi., p. 213) I gave reasons for the view that at least some of the forms of aurora borealis are caused by a type of rays which, as regards absorption by matter, follow the same law as  $\alpha$  rays from radio-active substances. In the letter I also mentioned that the diurnal distribution of aurora apparently would require a negative charge of the rays.



My arguments which lead to a negative charge was based on the assumption that the simplest orbits, like that of (a), ought to occur more frequently than the more complicated, like that of (b), both of which are theoretically possible. This assumption, which indeed might seem legitimate, is not, however, a consequence of exact mathematical calculation, for the problem of finding the relative probability of the occurrence of the various possible orbits has not yet been solved.

Further, an exact determination of the diurnal distribution of aurora is made difficult through the effect of sun- and moonlight; but, even if we take it for granted that the aurora are most frequently found on the evening side, there is, so far as our present knowledge goes, no necessity for assuming a negative charge of the cosmic rays.

Moreover, the explanation of the thin drapery form, given by Störmer,<sup>1</sup> requires orbits like (b) having turned round the magnetic axis a great angle, and if such an orbit is going to strike on the evening side a positive charge is necessary. These matters will be more fully discussed in a subsequent paper.

There are some other points not mentioned in my previous note which are of considerable interest. In order to explain from the radiation theory the formation of thin drapery bands, a strictly homogeneous radiation is neces-

<sup>1</sup> Arch. de Sc. Phys. et Nat., 1907.